INDUSTRIAL GAS ANALYZER FD-600
FORENSICS DETECTORS™

INDUSTRIAL SPEC GAS ANALYZER with BUILT-IN PUMP

Model: FD-600

Manual Print Version: 11.0

[ ] Headspace Analyzer
[ ] Air Quality Analyzer
[ ] Weld, Purge Analyzer
[ ] N2 Analyzer
[ ] Exhaust Analyzer
[ ] Custom Build

USER MANUAL

FORENSICS DETECTORS

Serial #:

O2 sensor	
CO sensor	
EX LEL% sensor	
H2S sensor	
CO2 sensor	
O3 sensor	
VOC sensor	
Other sensor?	
Telescopic 4ft Probe	
Headspace Probe	
2 Inch Probe	
1 Foot Probe	
3 inch Probe	
Exhaust Alligator Probe	
Other?	
FD-600 Analyzer	
Case	
USB Cable & Charger	
QC/CAL Certificate	
User Manual	
(B) Belt Clip or (M) Magnet?	

Date:

Signature:

GAS SENSOR RANGES, RESOLUTION & DEFAULT ALARM SET POINTS

****check which sensor(s) is in your gas analyzer by checking the back label**

Target Gas	Range	Resolution	Low Alarm	High Alarm
CH4 (EX)	0-100%LEL	1%	20%LEL	50%LEL
CH4 (EX) EXPLOSIMETER	0-100%LEL	1%	20%LEL	50%LEL
H2	0-1000ppm	1ppm	35ppm	250 ppm
H2 (HIGH)	0-40,000ppm	100ppm	10,000ppm	20,000ppm
H2S	0-100ppm	0.1ppm	10ppm	20ppm
CO	0-1000ppm	1ppm	50ppm	200ppm
CO (HIGH)	0-2%	0.01%	1%	1.5%
O2	0-30%vol	0.01%	19.5%vol	23.5%vol
O3	0-20ppm	0.1ppm	5ppm	10ppm
O3 (LOW)	0-5ppm	0.01ppm	1ppm	3ppm
CO2 (ppm)	0-5000ppm	1ppm	1000ppm	2000ppm
CO2	0-100%	0.01%	20%	50%
VOC	0-100ppm	1ppm	20ppm	50ppm
VOC (LOW)	0-10ppm	0.01ppm	1ppm	5ppm
SO2	0-20ppm	0.1ppm	5ppm	10ppm
Cl2	0-50ppm	0.1ppm	10ppm	20ppm
NO2	0-20ppm	0.1ppm	5ppm	10ppm
NH3	0-100ppm	0.1ppm	20ppm	50ppm
C2H4	0-100ppm	1ppm	20ppm	50ppm
NOx – NO **NOx – NO2**	0-5000ppm 0-1000ppm	1ppm 1ppm	1000ppm 100ppm	2000ppm 200ppm
Nitrogen (N2) using O2 sensor	0-30%vol	0.01%	19.5%vol	23.5%vol

ANALYZER SPECIFICATIONS

Warranty:	1-year limited warranty
Sensor:	Electrochemical for all gases except Catalytic for %LEL and NDIR for CO2
Sensor Life:	2 to 3 years for Electrochemical & Catalytic, > 5 years for CO2 NDIR
Recommended Calibration:	every 12 months
Error:	< ±5% F.S.
Response Time:	< 30 seconds
Store/Oper. Temp:	0°F - 122°F
Store/Oper. Humidity:	< 95%RH
Battery:	DC3.7V Li-Ion battery 3200mAh
Charging Time:	4 hours
Operation Time:	>10 hours
Dimension/Weight:	5.1 x 2.6 x 1.2 inches, 400grams
Explosion-Proof Grade:	ATEX certified Ex ib IIC T4 Gb
Pump Noise:	<60dB
Pump Rate:	0.3 LPM - 0.5 LPM (300 - 500 cc/min)
Inlet Air Barb:	3mm diameter

CARRY CASE DETAILS

Weight:	1.6lb with analyzer & accessories
Dimension:	9 x 7 x 5 inches

APPLICATIONS

1. Air Quality Analyzer: Indoor air quality assessment and leak testing. Comes with tubing and a 4ft telescopic probe.

2. Headspace Analyzer: Made for modified atmosphere packaging (MAP). Comes with filters, needles tubing and septa. Sensing options O2, CO2 and CO.

3. Purge, Weld & N2 Analyzer: Made for use of inert gas to flush such as welders that require to detector low oxygen, cryogenics, and inert nitrogen.

4. Special: Other uses include, breath analysis, storage tank headspace, safe space sterilization, personal safety, research, toxic gas testing and specialized process analysis. Please consult with us to determine best "filter" options for most accurate measurements (if required).

PRODUCT FEATURES

- **32bit microprocessor, color display and graphing**
- **Rugged industrial design and build**
- **ABS and rubber housing, explosion proof**
- **Rechargeable Lithium-ion battery via easy USB charger**
- **Professional aluminum case**
- **ATEX, CNEX, FCC, IP65 certifications**
- **Built-in pump and easy barb hose connector**

1. INTRODUCTION

You have purchased the FD-600 **INDUSTRIAL GAS DETECTOR by FORENSICS DETECTORS™.** The detector is factory calibrated, TURN ON AND GO! This product is an INDUSTRIAL gas analyzer with graphing, color display and alarm logging. This detector is made with a robust ATEX design using high quality electrochemical sensors. This detector was made for industrial use for oil and gas professionals, technicians, contractors, food technology engineers, energy inspectors, and many other applications that need to air and gas quantities with precision pump control. This detector is made to endure harsh handling with Explosion-proof grade of Ex ib IIB T4 Gb and Protection Grade: IP65.

2. QUICK SETUP

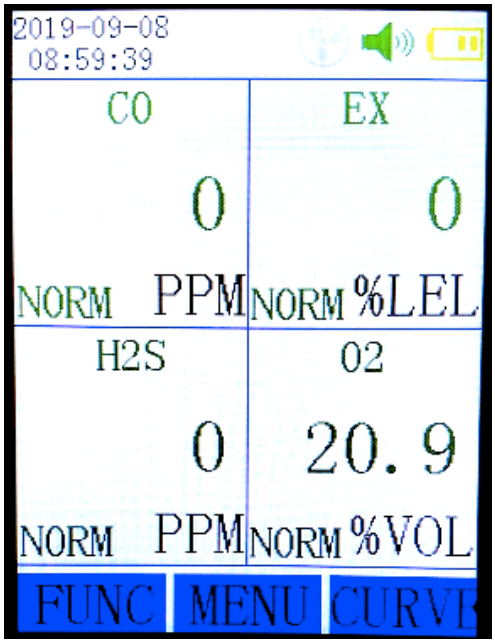
1. Ensure all components are included.
2. Ensure analyzer is fully charged. If not, please charge the battery first.
3. Double check all tubing is well connected and in place. Check all connections.
4. Turn ON the detector. After countdown the pump turns ON and READY.
5. Start measuring. Real-time measurements are shown on the HOME screen.
6. Read this manual and familiarize yourself with the operation.
7. Always be safe.
8. Before turning OFF, flush/purge the air out the detector by allowing the pump to run for 60 secs to allow fresh air to purge the instrument.
9. Ensure tubing and items are clean before storing as to avoid any contamination, residual odors or toxic gases that may poison the sensor.

3. ANALYZER OPERATION

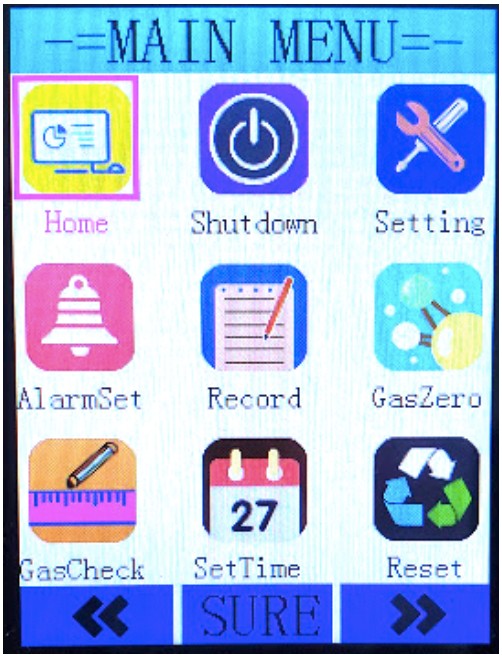
ON/OFF: Press MIDDLE button for 3 seconds. After 60 sec countdown gas detection begins, pump is ON and real time detected gas levels is show on the **HOME DETECTION SCREEN.** Start measuring. To turn OFF, press MIDDLE button for 3 secs. When in normal operation, the Home Detection Screen will appear like below on the left image. In normal ambient fresh air all sensors should read ZERO except O2 (oxygen) that is normally at 20.9%.

MENU MODE: Press the MIDDLE button to enter the main MENU SCREEN. The menu screen is shown below right. Use LEFT and RIGHT buttons to make your selection, press MIDDLE button to select. Menu option selections are explained in the following sections.

HOME DETECTION SCREEN



MENU SCREEN

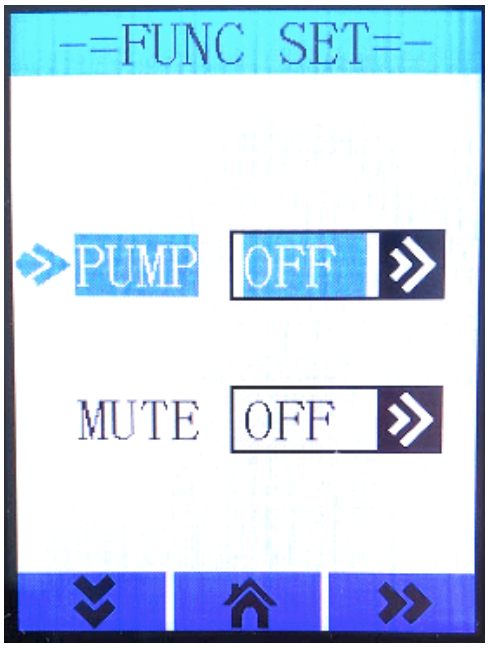


PUMP CONTROL AND MUTE: When in the Home Detection Screen, press the left button (FUNC) selection. This will take you to a screen menu that allows you

to control the PUMP ON/OFF and MUTE ON/OFF. Use the left and right button to select and toggle. Press the middle button to go back to the HOME detection screen. Turn the PUMP OFF to preserve battery life when appropriate or to limit sample size such as in a headspace food gas analysis. When the pump is under load the pump icon will turn RED and a few beeps will be heard. This is normal especially when first placing the headspace filter and needle to take samples.

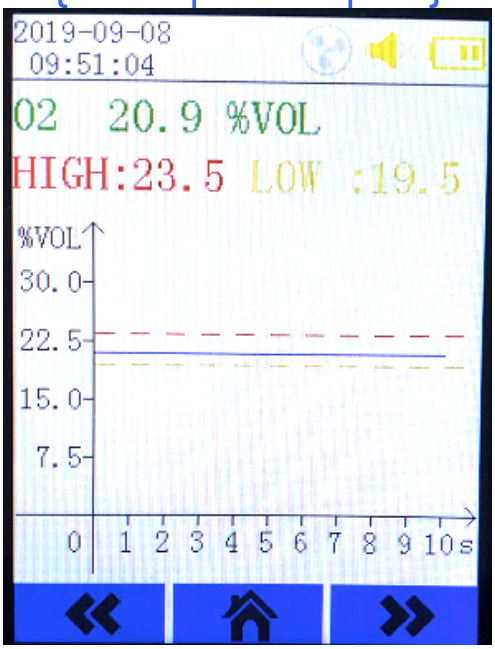
CURVE PLOT SCREEN: When in the Home Detection Screen, press the right button (CURVE) selection. You will see the concentration of the sensor data being plotted in real-time over 10 seconds. The dashed lines are at the alarm levels that are set/modified by the user. To toggle to another gas plot simply press the left or right button until your gas selection appears. Press the middle button to return to the Home Detection Screen. Although this device does not have a "print" function, we recommend taking photo pictures of any interesting plots that may be useful for analysis.

FUNCTION SET SCREEN



CURVE PLOT SCREEN

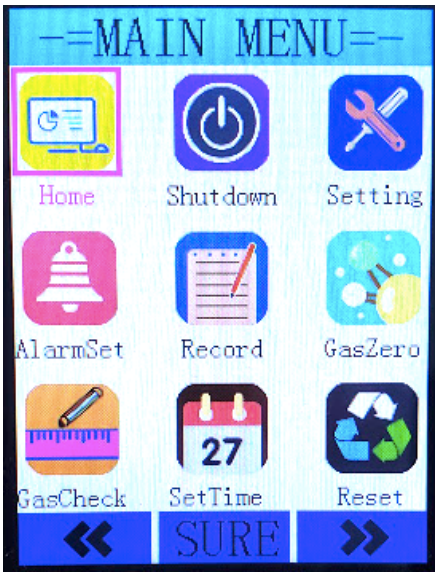
(Example O2 plot)



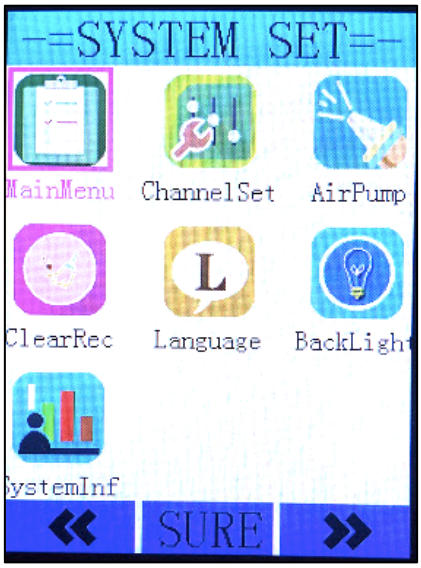
MENU OPTIONS

MENU: To enter the MENU mode, press the middle button when in the HOME Detection Screen. The MENU screen is like the picture in the below left.

MENU SCREEN



SETTING SCREEN



Shutdown: Shutdown the device.
Setting: The setting screen has more options to choose:

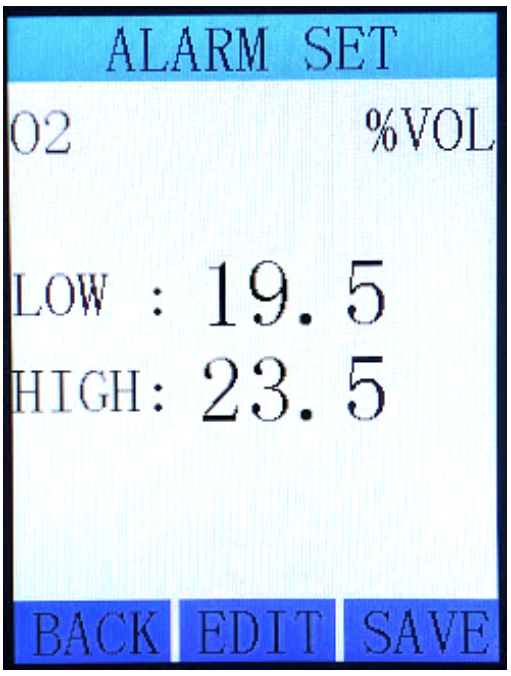
1. **ChannelSet:** Summarizes the sensor channel information for each available sensor. It is also used to change/toggle the displayed concentration unit of measure (i.e. ppm, mg/m^3 or other). Changes will not be required as the most popular settings are always preset as default.
2. **AirPump:** This is a load calibration value. If a value >70, the pump is under load and will beep to let the user know too much load is being experienced by the pump. Check for any blockage or kinks in the tubing. One can also SAVE the load value so the alarm warning is not activated – and recalibrates the pump to the new "load" pump conditions.
3. **ClearRec:** Password 1111 then enter. This option allows the user to clear the alarm records in the memory of the device.
4. **Language:** Language options.
5. **Backlight:** Select the time for the screen to remain ON or Auto OFF delay.
6. **SystemInf:** Summarizes alarm points, and maximum detection limits.

ALARM SETTINGS

AlarmSet: Alarms are triggered (LED flashes, Buzzer and Vibration) when alarms points are met/exceeded. To change the alarm set points select AlarmSet in the Main Menu (see prior section). A screen to select your gas will appear like the image below on the left. Select your gas and edit to change the alarm set point / trigger point as shown in the right image. When alarms are triggered a warning symbol is shown within the corresponding gas display section within the HOME DETECTION SCREEN. When triggered, the alarm is highlighted in **YELLOW** (LOW alarm) or **RED** (HIGH alarm) on the **HOME Detection Screen.** To avoid any annoying alarm, set the alarm either as LOW or HIGH as possible so the alarms are not triggered.

ALARM SET
(select gas)

ALARM SET
(Example: O2 alarm value)



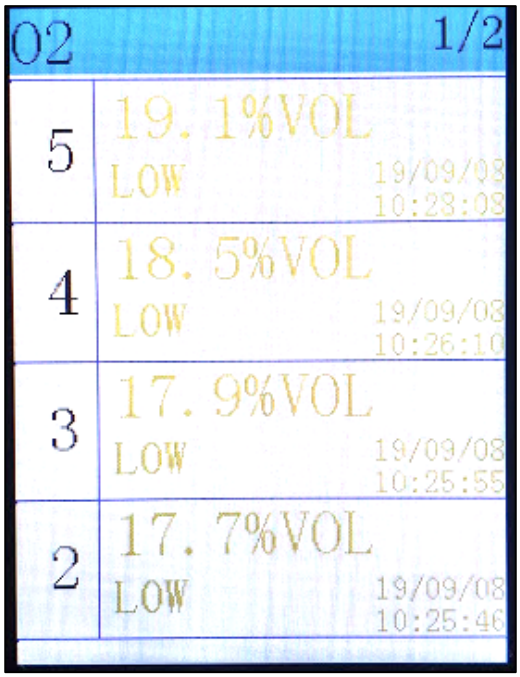
NOTE: If ALARM triggers are critical to your application, always check the alarm setting to ensure you are protected and alarm settings are as you anticipate to avoid harmful exposure levels.

RECORDING ALARM DATA

Record: When alarms are triggered they are automatically recorded with a date and time stamp along with the (min or max) alarm data point. This is useful for safety personnel to keep track of exposures for record keeping and exposure analysis purposes. To explore this information, select Record in the Menu Screen. This will take you to the various gases as seen on the below image on the left. Each gas will be listed along with the number of alarm records shown in parenthesis. Select a gas and a list of alarm records will be shown similar to the example image below on the right.

RECORD
(Select gas)

RECORD LIST
(Example)



DATA LOGGING

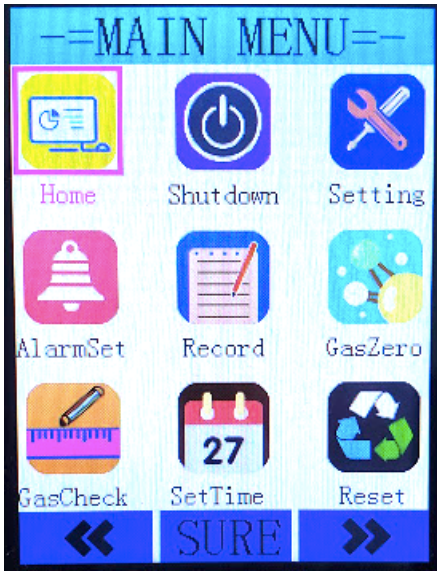
This unit is able to transfer data to a computer for remote sampling, data logging and continuous monitoring. The detector needs to be connected to a PC. Go to **www.forensicsdetectors.com** and then go to our software data logging page for FD-600 instructions and associated YouTube tutorials.

ZERO CALIBRATION

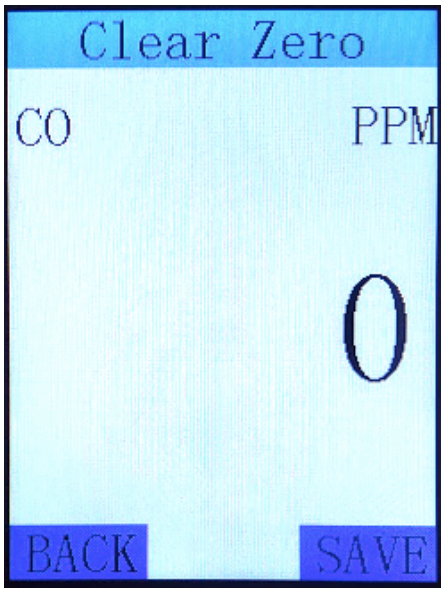
GasZero: GasZero should not be used very often - only if for some reason the baseline zero value of the sensor value is flickering or drifting and does not maintain a zero value. For gases such as oxygen however, exposing the sensor to pure ZERO nitrogen gas is important to maintain accuracy and for good measure this should be undertaken periodically between 6-12 months (i.e. every calibration cycle). For most gases (other than O2), if the sensor continues to read above zero, cross sensitivity to vapors or other gases may be possible. Ensure a fresh environment to diagnose this situation, particularly after high concentration exposure.

Select GasZero from the Main Menu Screen. Select Gas to ZERO. Expose to ZERO air for 1 min. Use fresh air for H2S, CO and %LEL. For O2 expose to pure N2. Maintain a flow of about 0.5L/min to deliver the gas to the detector (i.e. via the inlet). Then press SAVE button to confirm the zero value. When complete, "SAVE SUCCESS" is displayed.

MENU SCREEN



Gas Zero
(Example CO sensor)

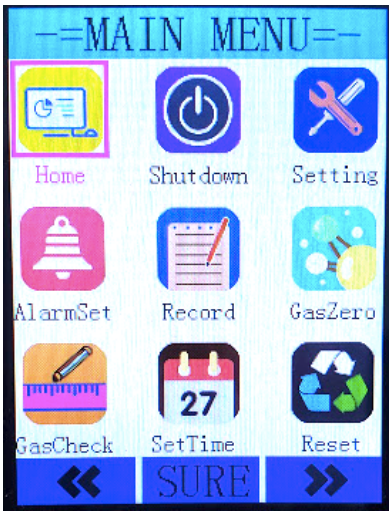


SPAN CALIBRATION (see our YouTube Channel for Calibration tutorial)

GasCheck: Span calibration is undertaken to ensure accurate gas concentration reading (i.e. ensure that the display reading in ppm is accurate and true). For example, an OSHA safety officer using a CO detector used in the field would want to calibrate to a concentration of 50ppm, since ambient CO is usually in the lower range. The span calibration gas concentration chosen is best chosen to represent the concentration that the sensor typically is exposed to, as to ensure maximum accuracy for daily application usage. We recommend calibration to be undertaken every 6 months. For analytical and highly specific applications, calibration can be undertaken more often to ensure the highest accuracy. If left beyond 6 months, the accuracy of the analyzer will be compromised.

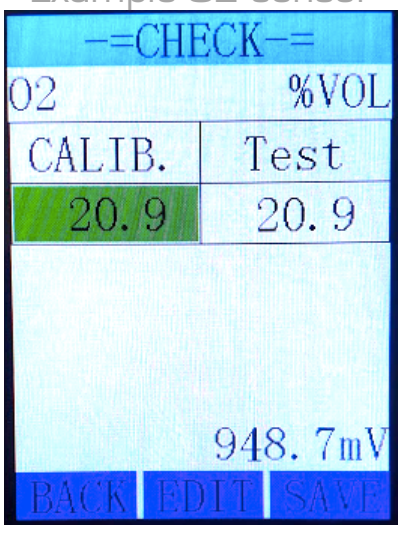
To undertake span calibration from the MENU SCREEN select GasCheck. Select passcode 1111. Select Gas to Span Calibrate. Expose to CAL gas for 1 min. For O2, simply expose the analyzer to fresh air, which will have 20.9% of O2. When using gas bottles, maintain a flow of about 0.5L/min when using gas bottles. Enter and edit the gas concentration so the detector knows the concentration of the calibration gas. After exposure, press SAVE. When complete, "SAVE SUCCESS" is displayed. Use an appropriate multigas mixture is OK or single gas mixture is also OK to calibrate a single sensor. Again, for oxygen, don't forget to simply use fresh ambient air 20.9%.

MENU SCREEN



GasCheck

Example O2 sensor



TIME AND DATE

SetTime: Select SetTime from the Main Menu Screen. Select EDIT to make the necessary date and time changes.

4. BATTERY CHARGING

The ANALYZER has a built-in lithium battery and can be charged via micro-USB port. USB Charger must be rated >1.0A for fast charging. Before charging, TURN OFF the analyzer to avoid any potential damage. Charging takes about 4 hours. When charging is required the screen will display LOW BATTERY along with two beeps/minute. Do not charge the device in a combustible area.

5. OPERATIONAL TIPS

- ✓ When in the ON state, after the display has switched OFF, the LED will flash every 20 seconds to reassure the user the detector is still ON and operating – useful for dark situations and when the screen is OFF (to save power).
- ✓ Before turning the detector off don't forget to flush/purge out the detector by allowing the pump to run for 60 secs to allow clean air to purge.
- ✓ Ensure tubing and items are clean before storing as to avoid any contamination, residual odors or toxic gases that may poison the sensor.
- ✓ The sensors have a rated life of 2 years. If well taken care of, they can last longer (up to 3 years) but will require more frequent calibration.
- ✓ Ensure periodic calibration every 6 months so that the performance of the detector remains within specification. If the calibration period is >6 months, the detector still operates but accuracy will be compromised.

*** * WARNING * ***

- ➢ KEEP DETECTOR **AWAY** FROM ELECTROMAGNETC & MAGNETIC INTERFERENCES (i.e. PHONES & MAGNETS)
- ➢ STORE DETECTOR **WITHIN SPECIFICATIONS**
- ➢ IF UNWELL, SEEK CLEAN AIR & MEDICAL ATTENTION.
- ➢ **FOLLOW INSTRUCTIONS AS THE DETECTOR IS VERY SENSITIVE**
- ➢ **TO ENSURE** ACCURACY, CALIBRATE DEVICE AT LEAST **EVERY 6 MONTHS**
- ➢ THE DETECTOR IS NOT RECOMMENDED FOR USE IN FLUE GAS AS THE UNIT DOES NOT HAVE A WATER TRAP NOR A NOX FILTER and PROBE WILL NOT WITHSTAND TYPICAL FLUE GAS TEMPERATURES.
- ➢ CHECK AND SET ALARM LEVELS APPROPRIATELY TO AVOID HARMFUL EXPOSURE - CONSULT WITH YOUR SAFETY OFFICER OR WITH STATE/FEDERAL AGENCIES.

INDUSTRIAL GAS ANALYZER FD-600
FORENSICS DETECTORS™

AIR QUALITY ANALYZER
WITH 4ft TELESCOPIC PROBE

FORENSICS DETECTORS

- Multigas Analyzer
- Built-in Pump
- 4 Foot Probe
- Charger & Cable
- English Manual
- Calibration Certificate
- Heavy Duty Case
- 1 Year Warranty
- USA Quality Control
- USA Customer Care

ANALYZER WITH FOOD HEADSPACE KIT

ANALYZER WITH WELDING KIT

WARRANTY DISCLAIMERS

This product is covered by a one-year limited warranty.
This warranty does not cover damage resulting from accident, misuse, disassembly, abuse or lack of reasonable care of the product, or applications not in accordance with the user manual. It does not cover events and conditions outside of our control, such as Acts of God (fire, severe weather etc.). It does not apply to retail stores, service centers or any distributors or agents. We will not recognize any changes to this warranty by third parties. We shall not be liable for any incidental or consequential damages caused by the breach of any express or implied warranty. Except to the extent prohibited by applicable law, any implied warranty of merchantability or fitness for a particular purpose is limited in duration for 1 year.
THIS PRODUCT CANNOT BE REPAIRED IF THE UNIT IS TAMPERED WITH IT WILL INVALIDATE THE GUARANTEE. IF THE UNIT IS FAULTY PLEASE RETURN IT TO YOUR ORIGINAL SUPPLIER WITH YOUR PROOF OF PURCHASE.

Support & Sales

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